

Claims

1. Apparatus for digital processing of audio signals, intended in particular for the treatment of subjects suffering from audio-phonatory disorders, characterised in that it comprises an analogue audiofrequency signal input (E), followed by an analogue-digital encoder (2), then an envelope detector (6), a digital limiter (10), a multiplier (12), a synthesiser (14) and finally a digital-to-analogue converter (16), and in that
- the analogue-digital encoder (2) is designed to reflect the analogue audiofrequency input signal by a first sequence of digital values,
 - the envelope detector (6) is designed to establish, from the first sequence of digital values, a second sequence of digital values reflecting the envelope of the audiofrequency input signal,
 - the digital limiter (10) is designed to establish a third sequence of limited digital values, from the second sequence of digital values,
 - the multiplier (12) is designed to establish a sequence of modulated emission frequency values according to the values of the third sequence of digital values,
 - the synthesiser (14) is designed to provide a digital audio signal from the sequence of emission frequency values, and
 - the digital-to-analogue converter (16) is designed to produce an analogue output signal from the digital audio signal.
2. Digital processing apparatus according to claim 1, characterised in that the limiter (10) is adapted to establish the third sequence of digital values in accordance with a first law laid down so that the modulated emission frequency values are contained between a selected lower frequency value and a selected upper frequency value.
3. Digital processing apparatus according to claim 2, characterised in that said first law takes into account the values of the third sequence of digital values and a chosen threshold amplitude value.

4. Digital processing apparatus according to claim 3, characterised in that said first law is a function of:
- a threshold value,
 - the logarithm of the lower frequency value,
 - 5 - and the logarithm of the upper frequency value.
5. Digital processing apparatus according to claim 4, characterised in that said first law calculates each value of the third sequence of digital values as being the ratio of a value of the second sequence of digital values over the threshold amplitude
- 10 value raised to a power equal to the ratio of the logarithm of the ratio of the first and second frequency values, over a threshold value.
6. Digital processing apparatus according to one of claims 2 to 5, characterised in that the multiplier provides the product of the values of the third sequence of
- 15 digital values and said upper frequency value.
7. Digital processing apparatus according to one of claims 2 to 6, characterised in that said upper frequency value is selected to be close to the highest frequency audible by the subject by upper values.
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8. Digital processing apparatus according to one of the preceding claims, characterised in that for each value of the sequence of emission frequency values, the synthesiser (14) develops a corresponding fundamental frequency signal with at least one harmonic.
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9. Digital processing apparatus according to one of the preceding claims, characterised in that it comprises a digital low pass filter (8) between the envelope detector (6) and the digital limiter (10).